



Operating Instruction Manual

Norelco[®]

**Tape Cassette
CARRY-CORDER '150'**

MODEL EL3302

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INTRODUCTION

You are now the owner of the Norelco Carry-Corder '150', a portable, fully transistorized tape recorder that is precision engineered to meet the highest mechanical and electronic standards.

Understandably, you are anxious to begin using your new tape recorder; however, we urge you to take the time to read these simple instructions. They are designed to help you gain the utmost in enjoyment and performance from your Norelco tape recorder. In this booklet you will find the basic operating and maintenance procedures, plus additional information you should know about your Norelco Carry-Corder '150'. By reading these

instructions, you will be rewarded with a knowledge of the capabilities of your tape recorder, and with many hours of troublefree recording and listening pleasure.

Your Norelco Carry-Corder '150' is a compact portable unit which operates anywhere . . . without any external power source. Now you can make recordings while traveling, in your backyard — any place.

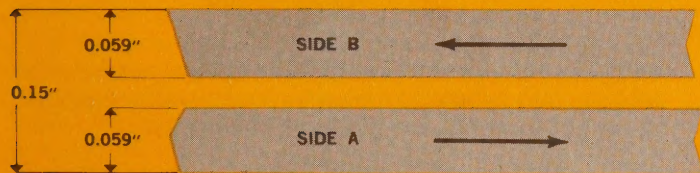
Another outstanding feature of your Norelco Carry-Corder '150' permits you to make recordings of your favorite music at home, and take them with you to the country; you can listen to your favorite music in your car, tent, or boat.

COMPACT CASSETTE SYSTEM

The entire compact cassette system uses a standard tape speed of $1\frac{7}{8}$ ips and is compatible; i.e., monaural and stereo recorded cassettes can be played on either *stereo* or *monaural* cassette recorders without any loss in quality. The compatability is illustrated in the above diagram. The left side shows the monaural track position (note track width .059 inch); on the right side, the track of .059 inch is split into two stereo tracks of 0.024 inch each (left and right channels). Because the total track width of the left and right stereo channels is equal

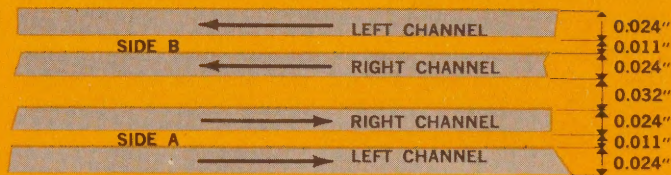
to that of the monaural track, when a stereo cassette is played on a monaural recorder the playback head will scan both the left and right channels together. This results in automatic mixing of the left and right channels from the stereo tape giving you true monaural reproduction without any loss in the quality of the playback. Because of the compatibility most prerecorded Musicassettes are compact tape cassette stereo recordings and can be played on the Carry-Corder's monaural system with no loss of fidelity.

COMPACT CASSETTE SYSTEM

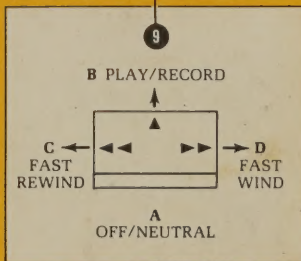
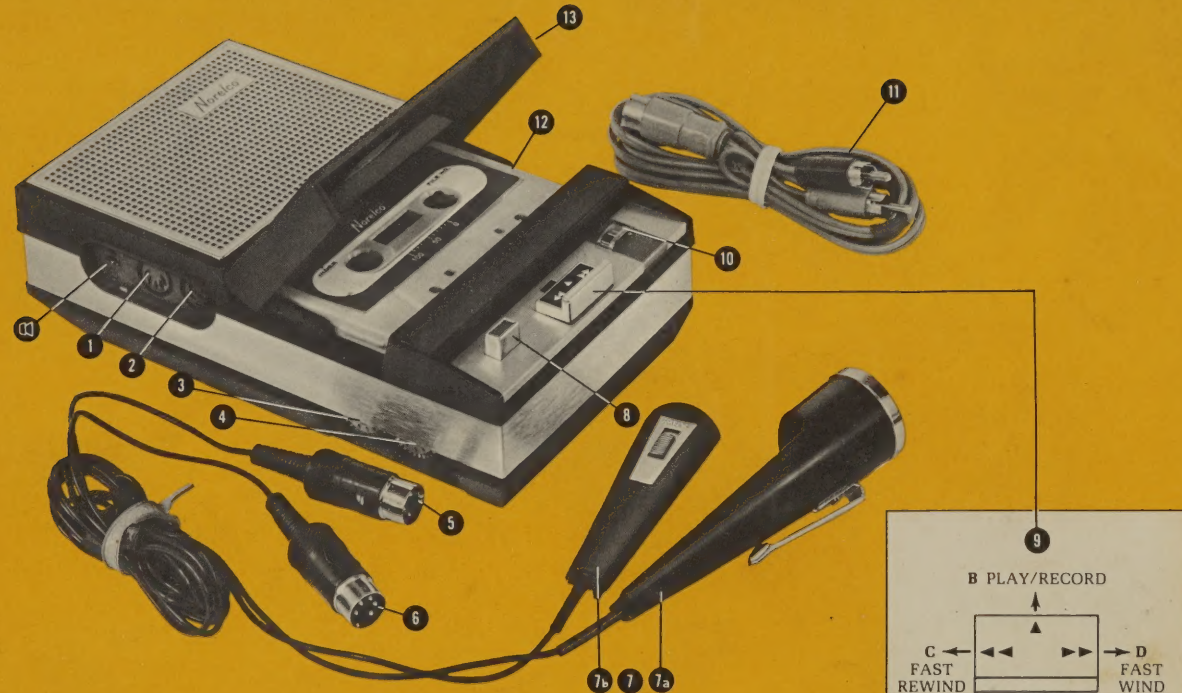


MONO

Arrows indicate tape motion in Play / Record



STEREO



CONTROLS AND CONNECTIONS

- External Speaker/Headphone Socket** – Connection socket for an external speaker or headphone (5 to 8 ohms). The internal speaker in the Carry-Corder is automatically disconnected when this socket is used.
- Socket (1)** – Connection socket for Microphone three-pin plug (5) for recording, or Patch Cord (11) three-pin plug for recording/playback with a radio, tuner, phonograph, etc. (optional accessories input).
- Socket (2)** – Connection socket for five-pin plug of the Microphone Switch (6) for remote start/stop control of the Carry-Corder (optional accessories input).
- Volume Control (3)** – Adjusts playback volume to the desired level.
- Record Level Control (4)** – Used to adjust the incoming signal to the proper recording level which is shown on the VU Meter/Battery Indicator (10).
- Microphone Plug** – Three-pin plug that connects to Carry-Corder Socket (1).
- Start/Stop Microphone Switch Plug** – Five-pin plug that connects to Carry-Corder Socket (2).
- Microphone** – Omni-directional dynamic Microphone (7a) with detachable Start/Stop switch (7b).
- Record Lock** – Red record lock safety pushbutton locks the Carry-Corder in the record mode when it is held depressed while setting the Function Knob (9), to the Play/Record \blacktriangle position. Note: The Record Lock pushbutton can be depressed only when a "recordable cassette" is loaded in the machine (see Automatic Erasure Safety Feature).

9 Function Control Knob

A OFF/NEUTRAL – All functions of the Carry-Corder are activated by movement of the Function Control Knob (9) from this position (starting point). Always make sure the Carry-Corder is in this mode after use (storage).

B PLAY/RECORD \blacktriangle – Push control knob forward (\blacktriangle) in direction of (B) to start tape movement for playback or recording. Pull control back to Off/Neutral to stop tape movement.

C FAST REWIND $\blacktriangle\blacktriangle$ – Push and hold control knob in direction of (C) to fast rewind the tape. Release control knob to stop tape movement – control automatically returns to Off/Neutral.

D FAST WIND $\blacktriangleright\blacktriangleright$ – Push and hold control knob in direction of (D) to fast wind the tape. Release control knob to stop tape movement – control automatically returns to Off/Neutral.

10 VU Meter/Battery Indicator – Provides a visual indication of recording level during record mode; indicates battery condition in playback, fast wind/rewind modes.

11 Patch Cord – Used for recording or playback with external equipment. Three-pin plug connects to Socket (1) on the Carry-Corder. The phono plugs on the other end of the patch cord are connected as follows:

Playback – grey phono plug to external amplifier
Record – red phono plug to external signal source (radio/tuner, phono, second recorder, etc.).

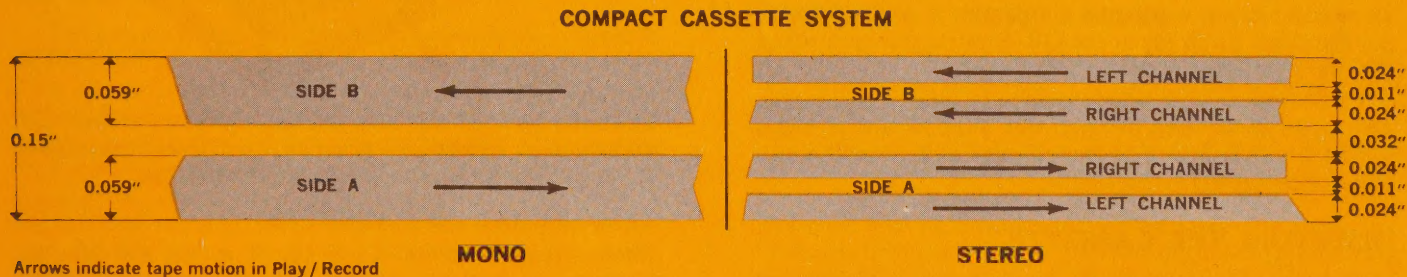
12 Tape Cassette – Cassette is shown loaded in the Carry-Corder ready for recording or playback.

13 Cassette Compartment Lid – Detachable lid lifts back to permit inserting or removing the cassette.

COMPACT CASSETTE SYSTEM

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to that of the monaural track, when a stereo cassette is played on a monaural recorder the playback head will scan both the left and right channels together. This results in automatic mixing of the left and right channels from the stereo tape giving you true monaural reproduction without any loss in the quality of the playback. Because of the compatibility most prerecorded Musicassettes are compact tape cassette stereo recordings and can be played on the Carry-Corder's monaural system with no loss of fidelity.



COMPACT CASSETTE

There are two versions of the Compact Cassette: the C60 with a total playing time of sixty minutes (thirty minutes each side) and the C90, total playing time ninety minutes (forty-five minutes each side).

Clear leader tape is attached to each end of the recording tape in the cassette. The ends of the leader tape are permanently secured to hubs inside the cassette; therefore, the tape cannot pull loose. No tape threading is necessary and the cassette housing protects the tape from damage; therefore, the cassette can be inserted or removed easily at any time, not just at the beginning or end of the tape.

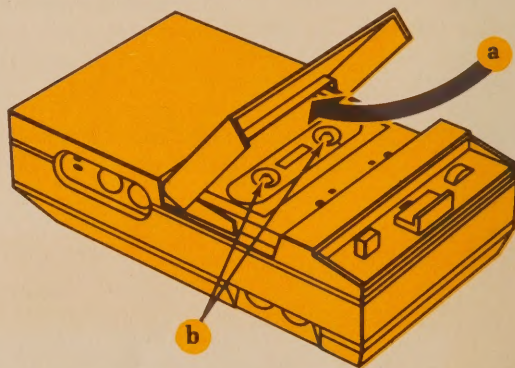
The tape stops automatically when it is fully wound onto the right or left hubs in the cassette. Caution — The drive mechanism continues to operate; therefore, return the Function Knob (9) to the Off/Neutral position when the end of the tape is reached.

There is a viewing window on each side of a cassette. The tape can be seen through this window and a rough estimate can be made of the amount of tape still available for recording or playback.

INSERTING THE CASSETTE

- Make sure Function Knob (9) is in the Off/Neutral position.

- Remove the cassette from the storage box and hold the cassette so that the front (exposed tape area) is facing you and the full hub of tape, as viewed through the cassette window, is on your left.



- Slide the back of the cassette into the compartment (a) and push the front of the cassette down over the spindles (b) as shown by the arrows in the illustration.

REMOVING THE CASSETTE

- Ensure that Function Knob (9) is in the Off/Neutral position.
- Grasp sides of the cassette and lift up and out.

- Cassette can be turned over and reinserted to use second side.
- Store cassettes immediately.

COMPACT CASSETTE INDEX

In the center of each Norelco cassette there is a Tape Use Index with markings from 0 to 100. A transparent window by the index indicates at a glance the amount of tape on each hub. Use this index as a guide when winding or rewinding to an approximate spot on the tape.

CASSETTE INDEX CARD

To keep accurate records of tape recordings, a cassette index card is enclosed in the plastic storage container. The cassette index card has space for indicating the sides of the cassette (A or B) on which a recording was made, the description of the recording, the date, and the index marking. Fill in the cassette index card as you record; then, when you wish to play back a specific part of the tape, simply insert the cassette in the recorder, use the fast wind or rewind to arrive quickly at the proper reference for that part of the tape you wish to hear.

COMPACT CASSETTE STORAGE

The plastic compact cassette storage container supplied with each cassette is dust proof and will keep the cassette safely stored for long periods of time. The cassette will fit only into the storage box in one way. The open end of the cassette should be fitted into the box. The box is designed to lock the hubs of the cassette to keep them from moving; the tape remains in the same position as when it was stored, ready for instant use.

Store the cassette at room temperature (not near any source of heat) and in a reasonably dry area. Do not store in an area that could be subject to strong magnetic fields; e.g., loudspeaker magnets, transformers, or electric motors.

BATTERIES — INSTALLATION

Batteries — Your transistorized Carry-Corder uses five 1½ V standard flashlight "C" batteries. We recommend that leak proof batteries be used.

A new set of batteries will provide approximately 20 hours of service under normal operating conditions (figured at about 2 hours of use each day). The life of the batteries will be proportionately increased or decreased if the recorder is used for shorter or longer periods. The amount of power used by the recorder is also proportionate to the volume of the sound during playback.

Therefore, a lower volume setting prolongs the service life of the batteries.

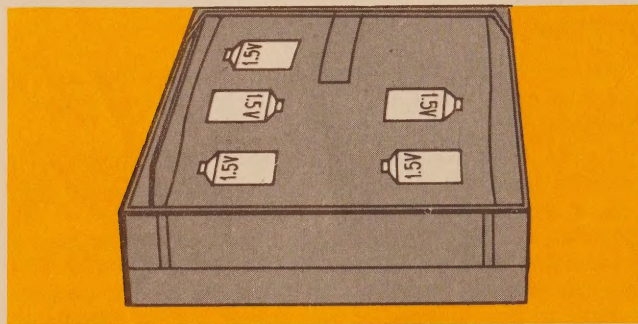
The battery compartment is accessible from the back of the Carry-Corder.

REMOVING BATTERY COMPARTMENT COVER

To open the compartment insert a coin into the slot by the arrow; twist the coin and pry up the cover in the direction of the arrow.

INSERTING BATTERIES

Insert the batteries into the compartment in accord-



ance with the diagram in the compartment. *The serial number of the Carry-Corder is directly under this diagram.* Make sure the caps of the batteries are placed in accordance with the diagram.

CAUTION

Inserting the batteries improperly will cause damage to the Carry-Corder.

REPLACING BATTERY COMPARTMENT COVER

Slide the cover in place in the opposite direction of the arrow until the lip of the cover is under the case; push down back of cover to snap it in place.

Checking the Batteries — Check the condition of the batteries after they have been installed and again each time the recorder is used. The VU Meter/Battery Indicator (10) is provided for this purpose.

To check the condition of the batteries, set the Function Knob (9) in the Play/Record position ▲ and observe the needle of the VU Meter/Battery Indicator (10). The batteries are in good condition if the needle rests within the green segment of the indicator. If the needle rests within the red segment, the batteries are weak and

should be replaced; however, the batteries still can be used for playback for a limited time, but should not be used for recording. The black area indicates the batteries are too weak for use in any function and should be replaced.

After the batteries have been checked, pull the Function Knob back to the Neutral/Off position.

NOTE When the recorder is not going to be used for any length of time, the batteries should be removed.

If for any reason the Carry-Corder must be shipped or packed away for a journey, remove the batteries and pack them separately.

Using the BE50 optional AC Adaptor accessory will operate the Carry-Corder from a 110V outlet and will energize the batteries and extend their useful life.

HOW TO USE THE PATCH CORD

Use the Patch Cord (11) for recording or playback with external equipment. The three-pin plug connects to Socket (1) on the Carry-Corder. The phono plugs on the other end of the patch cord are connected as follows:

Playback — Grey phono plug to external amplifier high level input; i.e., radio, TV, auxiliary, etc.

Record — Red phono plug to external signal source; i.e., radio/tuner, phono, second recorder, etc.

FAST WIND AND REWIND

The fast Wind (▶▶) and Rewind (◀◀) functions are used in conjunction with the cassette index to locate particular selections on a tape or to wind or rewind the tape at high speed.

REWIND After recording rewind the tape on the left-hand hub of the cassette—it will then be ready for playback. To rewind, push the Function Knob (9) to the Rewind (◀◀) position and hold until the desired spot on the tape is reached. Return the Function Knob (9) to the Off/Neutral position to stop tape motion when the end or desired place on the tape is reached.

WIND To fast wind the tape for any reason, such as to reach a desired spot as indicated on the Cassette index, move the Function Knob (9) to the Wind (▶▶) position and hold until the desired spot on the tape is reached. Return the Function Knob (9) to the Off/Neutral position.

NOTE If the tape is completely wound in either direc-

NOTE CONTINUED

tion, a friction clutch prevents it from tearing loose, even though the tape drive is running. Always return the Function Knob (9) to the Off/Neutral position.

PLAYBACK

- Insert a prerecorded cassette into the recorder.
- Make sure the tape is fully wound on the left side of the cassette. Use the rewind function ◀◀, if necessary.
- Set Function Knob (9) to Play/Record ▲. Check batteries — see Note 1.
- Adjust the Volume Control (3) to suit your listening requirements. Turning the Volume Control (3) to a higher setting increases the loudspeaker volume and, conversely, a lower setting decreases the volume.
- Set Function Knob (9) to Off/Neutral when you wish to stop playback or when the end of the cassette is reached.
- Turn cassette over to play the second side.

NOTE

1. The VU Meter/Battery Indicator (10) needle indicates the battery condition in the playback ▲ mode of operation (Green — good, Red — usable, Black — replace batteries).
2. It is recommended the Volume Control (3) be set no higher than is necessary for a pleasing listening level

because the louder the loudspeaker is played the shorter will be the battery life.

3. The Remote Control detachable microphone switch (7b) can be used to stop/start playback.
4. When in the Play/Record position (▲), the tape in the cassette will stop automatically when it reaches the end. However, the drive mechanism and transistors continue to draw power from the batteries; therefore, in order to prevent using the batteries up *always make sure the Function Control Knob (9) is set in the Off/Neutral position when playback is completed.*

PLAYBACK THROUGH EXTERNAL AMPLIFYING EQUIPMENT

- Connect the supplied Patch Cord (11) three-pin plug to Socket (1).
- Connect the grey phono plug at the other end of the Patch Cord to the external equipment high level input; i.e., tuner, T.V., auxiliary, etc.
- Set the Volume Control (3) to “0”; the sound is now controlled at the external amplifying device.
- Use the same operational procedure as in “playback” except for the Volume Control (3) setting which remains at “0” because output from the Patch Cord (11) is not affected by the Volume Control (3).

RECORD

HOW TO USE THE MICROPHONE

A microphone (7) with a detachable start/stop switch which controls the tape is supplied with the Norelco Carry-Corder. The microphone and switch can be used together or separately.

The microphone (7a) is a dynamic omni-directional type (picks up sound from all directions). The microphone is very sensitive and will pick up sounds from great distances; therefore, it can be used to record lectures, conferences, etc.

Due to the sensitivity and wide directional pickup pattern of the microphone, care must be taken in its use; because the microphone picks up all sounds, including unwanted ones, positioning and recording conditions are important.

The microphone can be held in your hand or clipped to any suitable object; i.e., Carry-Corder case strap, lapel, or breast pocket, etc.

- Connect the three-pin Microphone Plug (5) to Socket (1). Use of the Stop /Start switch (7b) is optional (Remote Control).
- Watch the VU Meter (10) while recording. The needle should just enter the red area of the scale only on occasional loud passages. Very soft passages may be given a higher recording level setting.

REMOTE CONTROL

REMOTE CONTROL MICROPHONE SWITCH

Both the record and playback functions can be started and stopped via remote control by using the detachable microphone Start/Stop switch (7b) which turns the battery power on or off.

Connect the five-pin plug (6) from the microphone Start/Stop switch (7b) to Socket (2). Operate the Carry-Corder for normal playback or recording and use the switch to stop and start the tape. Start – slide switch down (*Red Dot exposed*); Stop – slide switch up (*no Dot exposed*).

NOTE Always return the Function Knob (9) to the Off/Neutral position when use of the Carry-Corder is completed. The Start/Stop switch (7b) can be used com-

NOTE CONTINUED

pletely detached from the microphone and microphone cable. In order to wind or rewind, the switch must be in the start position before using the Function Knob (9).

DETACHING MICROPHONE SWITCH FROM MICROPHONE

Hold microphone (7a) firmly in hand; grasp microphone Start/Stop switch segment (7b) firmly in the other hand with the thumb on red switch and slide it down the length of the microphone toward the cord.

ATTACHING MICROPHONE SWITCH TO MICROPHONE

Hold the microphone (7a) in one hand and slide the two tracks at the bottom of the microphone switch (7b) into the two grooves at the bottom of the microphone (7a). With thumb on red switch, press microphone switch segment (7b) into place.

ACCIDENTAL ERASURE SAFETY FEATURE

The compact cassette is provided with a recording interlock safety feature to prevent accidental erasures of prerecorded tapes; it prevents the Record/Lock pushbutton (8) from functioning.

- The cassette has two sides labeled A and B. To prevent accidental erasures, in the rear of the cassette two knockout tabs (1 for each side) are provided and they



are easily removed by using any small instruments; i.e.: pencil, key, screwdriver, etc. A slight forward pressure on the tabs will remove it.

- In order to ensure removing the correct tab for the side you wish to protect (A and/or B), position the cassette so that the front (exposed tape area) is facing you and

the side you wish to protect is facing up. Remove the tab on the left rear of the cassette.

When the tabs are in place, the cassette is *recordable*. In cases where the knockout tabs were removed and you wish to make the cassette recordable again, place a piece of adhesive tape over the hole; this will defeat the recording interlock and allow the Record/Lock pushbutton (8) mechanism to perform its function again.

ERASING TAPES

When recording, all previous information on the tape will be automatically erased. It is not necessary to erase a tape separately before recording. However, if you desire to erase a section of tape (or a whole cassette of tape) set the Record Level Control (4) to "0", depress and hold down the Record/Lock pushbutton (8) and simultaneously move the Function Control Knob (9) to the Play/Record (▲) position. The tape will start running and anything recorded previously will be erased from the tape as it passes the erase head.

Only one side can be erased at a time.

RECORDING STEPS

Check the battery condition.

Load a recordable cassette into the Carry-Corder.

Make sure the tape is fully wound on the left side of the

cassette. Use the Rewind function (◀◀), if necessary.

Connect the program source (microphone, radio, tuner, phono, etc.) to the appropriate input socket on the Carry-Corder.

Turn the Record Level Control (4) to "0".

To start tape movement and recording, hold down the red Record/Lock safety pushbutton (8) and move the Function Knob (9) to the Play/Record (▲) position. The Record/Lock pushbutton (8) will remain locked in the record position until the Function Knob (9) is returned to the Off/Neutral position.

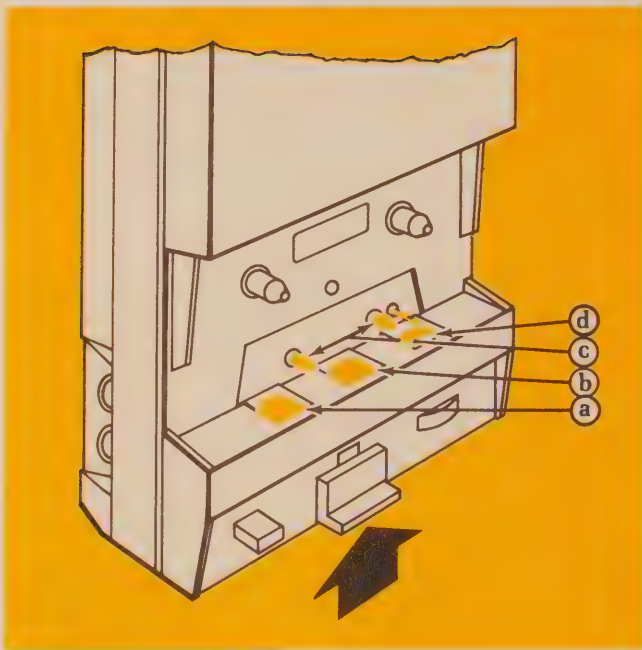
Increase the setting of the Record Level control (4) until the loudest passages of the program source deflect the VU Meter (10) needle from the black to just entering the red area. If the needle deflects into the red-green area, the recording level is set too high and the recording will be distorted (overload).

Use the Function Knob (9) to stop recording.

Use the Stop/Start switch (7b) for interruptions (Remote Control use of microphone or patchcord).

NOTE If the Record/Lock pushbutton (8) will not depress see "Accidental Erasure Safety Feature."

Connect the red phono plug on the patchboard to the external program source output (radio, tuner, phono, etc.).



MAINTENANCE

The Norelco Carry-Corder requires a minimum of maintenance. Over a period of time, tape oxide particles form on the magnetic heads, capstan shaft, and the rubber pressure roller. Clean as follows:

- Remove the tape cassette (12) from the Carry-Corder.
- Set the Function Knob (9) in the Play/Record (▲) position.
- Use a cotton-tipped stick or any lint free cloth wrapped around a small stick and clean the heads (a and b), the capstan (c) and the rubber pressure roller (d).

If it is difficult to remove the tape oxide, moisten the cotton tipped stick with just a little methyl alcohol (common household rubbing alcohol).*

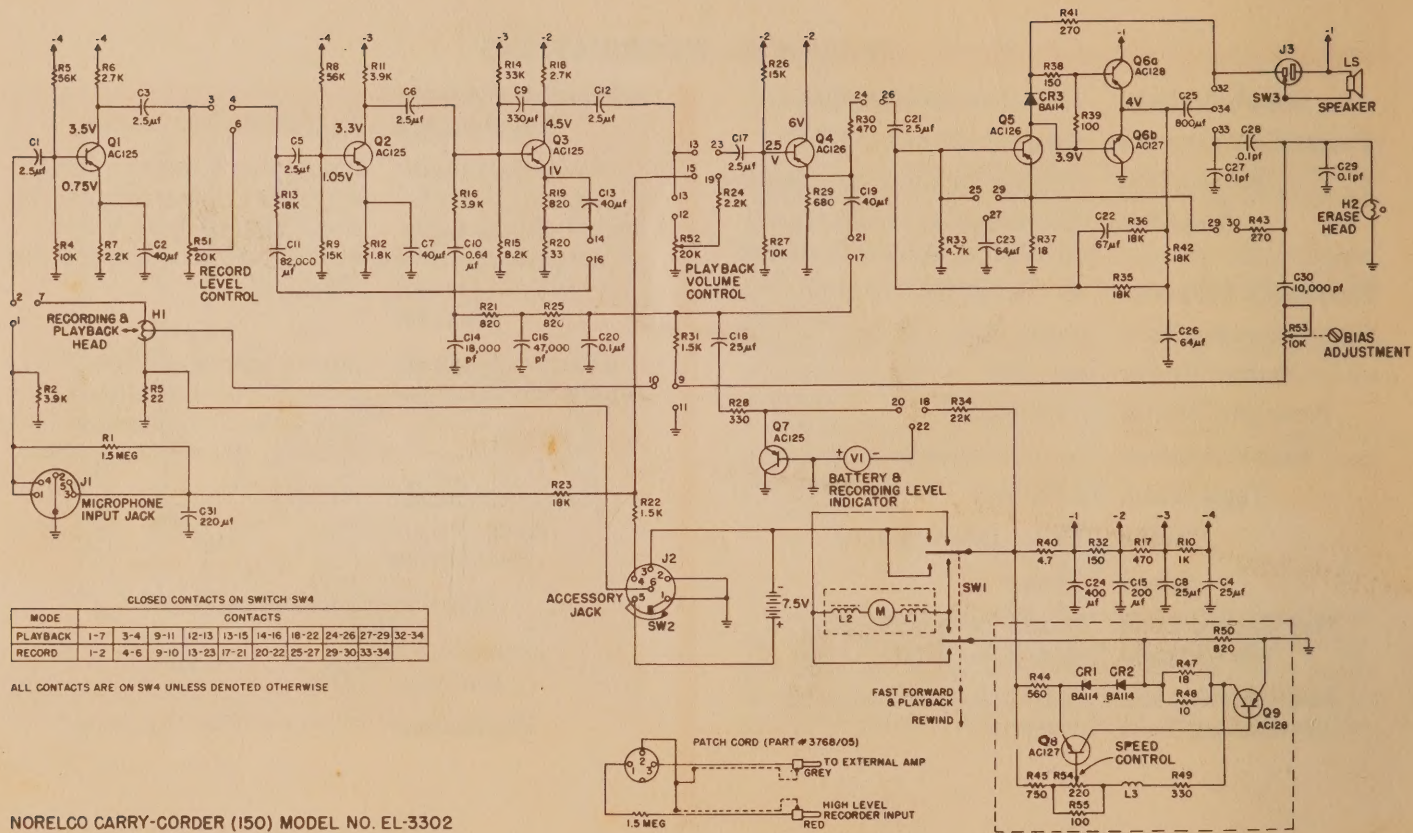
*CAUTION

Use methyl alcohol only. Commercial tape head cleaners may react unfavorably with the encapsulating compounds used in the record/playback and erase heads. Never clean the heads with a sharp or metal object. Do not use a brush with a metal band around the bristles.

TECHNICAL SPECIFICATIONS

Supply Voltage	7.5 V (five 1.5 V C cells)
Power Consumption	Approx. 105 mA at 7.5 V
Battery Life	Approx. 20 hours (2 hour/day)
Amplifier	All transistor, (4) AC125, (2) AC126, (2) AC127, (2) AC128
Frequency Response	80 - 10,000 Hz \pm 3 db
Signal-to-noise Ratio	Better than -45 db
Output Power	400 mW
Wow-and-Flutter	0.1% RMS
Bias Frequency	Approx. 45 kHz
Tape Width	0.150 inch
Tracks	Two — IEC Standard
Speed	1 $\frac{7}{8}$ ips
Play Record Time per Cassette	30 min. each side — C60; 45 min. each side — C90
Fast Winding and Rewinding Time	Less than 70 seconds C60 cassette

Admissible Ambient Temperature	41 - 113°F.
Combined input/output jack (1) for microphone, radio, amplifier, record player, second recorder	input (pins 1 and 4 parallel) 0.2 mV 2 k ohms; output (pins 3 and 5 parallel) 0.5 V 20 k ohms; pin 2 is common ground shielded)
Accessory jack (2) 5-pole, 240° DIN for	power supply unit (pin 1 = +, pin 3 = -); start/stop switch (pin 1 and 5); headphone (pins 2 and 4) 200 mV/1.5 k ohms
Jack for External Loudspeaker/Headphone	5-8 ohms
Housing	polystyrene, black
Weight with Batteries	4 lbs.
Dimensions	7 $\frac{7}{8}$ by 4 $\frac{1}{2}$ by 2 $\frac{1}{4}$ inches



NORELCO CARRY-CORDER (150) MODEL NO. EL-3302

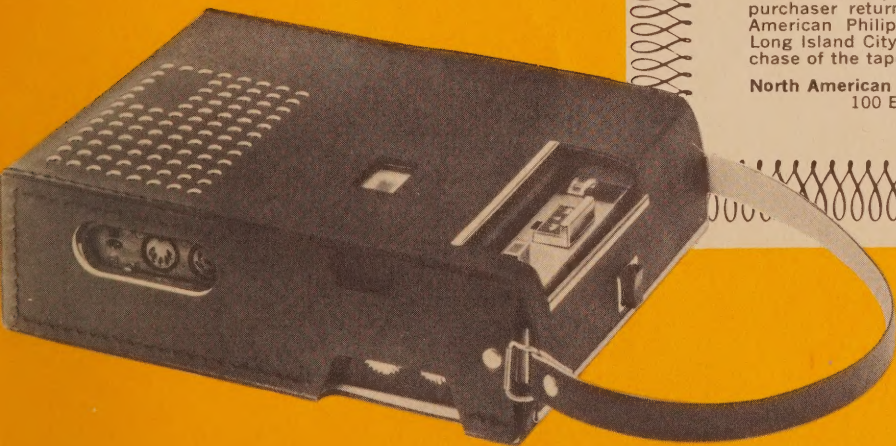
OWNERSHIP RECORD

CARRY-CORDER '150' SERIAL NO.
(IN BATTERY COMPARTMENT)

DATE PURCHASED

DEALER'S NAME

ADDRESS



WARRANTY

The North American Philips Company, Inc. warrants that each NORELCO tape recorder is free from defects in material and workmanship and agrees to repair or replace any part of the NORELCO tape recorder which under normal installation and use discloses such defect, provided the NORELCO tape recorder is delivered through the dealer to North American Philips Company, Inc. or any of its authorized service stations, intact, for examination with all transportation charges prepaid to the factory or authorized service station, within ninety (90) days from the date of delivery by the authorized NORELCO dealer to the purchaser and provided that such examination discloses in the judgment of North American Philips Company, Inc. that it is thus defective.

This warranty does not extend to any parts of the NORELCO tape recorder which have been damaged by battery leakage, subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation or to use in violation of instructions furnished by us nor to any NORELCO tape recorder which may have been tampered with, altered or repaired outside of our factory or authorized service stations.

This warranty is in lieu of all other warranties expressed or implied, and no one is authorized to assume any liability on behalf of North American Philips Company, Inc., or impose any obligations on it in connection with the sale of any tape recorder other than as outlined above.

This warranty is conditioned on and becomes effective only after the purchaser returns the detachable card, properly filled out, to North American Philips Company, Inc., Dept. "T," 30-10 Review Avenue, Long Island City, New York 11101 within four (4) weeks after the purchase of the tape recorder.

North American Philips Company, Inc., High Fidelity Products Division
100 East 42nd Street, New York, New York 10017

Norelco®

NORTH AMERICAN PHILIPS COMPANY, INC.
HIGH FIDELITY PRODUCTS DIVISION
100 East 42nd Street, New York, New York 10017